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REPORT FOR FISCAL YEARS 1970 AND 1971

Analytical and Special Support to Division of Technical Operations and Solid Waste Research

A Solid Waste Research
Open-File Report (RS-04-68-04)

written by
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U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Research and Monitoring
Solid Waste Research
1971

ABSTRACT

This report summarizes support services provided for the Division of Technical Operations, Division of Demonstration Operations, and Solid Waste Research for fiscal years 1970 and 1971. A total of 406 samples involving 964 determinations were analyzed during fiscal year 1970. In the following fiscal year 567 samples involving 2,046 determinations were analyzed in support of incineration, resource recovery, ultimate disposal, and other solid waste management research and development type studies.

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INTRODUCTION

The purpose of this project is to provide physical, chemical and microbiological laboratory support services for the Division of Technical Operations (DTO)* and Solid Waste Research (SWR)**. These analytical and special support services are for research, development and technical studies related to solid waste management and resource recovery. The project was initiated in 1967 to provide support services for the Division of Technical Operations and the Division of Research and Development. Open-File Report (SWR-35) summarizes analyses performed during fiscal year 1969. This report furnishes a summary of analyses performed for fiscal years 1970 and 1971.

*Office of Solid Waste Management Programs, EPA.

**Office of Research and Monitoring, EPA. Solid Waste Research was formerly the Division of Research and Development, Solid Waste Management Office, EPA.

TYPES OF SUPPORT SERVICES PERFORMED

a. Physical and chemical analyses of incinerator test samples such as: raw refuse, incinerator residue, scrubber water and quench water. Raw refuse and incinerator residues are analyzed for moisture, volatiles, ash, calorific value, carbon, hydrogen and other parameters as required. Scrubber and quench waters are analyzed for pH, alkalinity, chloride, hardness, sulfate, phosphate, conductivity and other characteristics.

b. Microbiological studies of incinerator performance includes: collection of samples during incinerator tests, shipment of samples to laboratory in refrigerated containers and quantitative determination of (1) total viable bacterial cells, (2) total coliforms, (3) fecal coliforms and (4) heat resistant spores. Qualitative determination of salmonella organisms and other tests are also performed as needed.

c. Physical, chemical and microbiological analyses of samples from resource recovery, ultimate disposal, processing and other research, demonstration and development studies on solid wastes. These analyses cover a wide range of analytical determinations such as: carbon and nitrogen for C/N ratio of compost, analysis of 5-hydroxymethylfurfural and glucose for resource recovery research, organic acid analysis of fermentation samples, analysis for quantitative saccharification of cellulose, tests for oils and grease in surface water samples from a landfill, analysis of fly ash particulates from an incinerator using a Coulter Counter system, and bacteriological testing of wallboard samples prepared from waste materials.

RESULTS FOR FISCAL YEAR 1970

Table 1 shows the type of studies, number of samples analyzed and the number of determinations performed by Support Services during fiscal year 1970. Approximately two-thirds of the samples were analyzed for the Division of Technical Operations in support of incineration and landfill studies. One fluid bed incinerator residue sample was submitted by the Division of Demonstration Operation for analyses. A variety of samples from resource recovery and ultimate disposal studies were analyzed for Solid Waste Research. The results of analyses were provided in eighteen memoranda listed on page 7 by title, date and the name of reporting individual.

RESULTS FOR FISCAL YEAR 1971

Table 2 furnishes a summary of the analyses performed by Support Services during fiscal year 1971. Approximately three-quarters of the samples were analyzed for Solid Waste Research studies and one-quarter for the Division of Technical Operations. The reduction in the number of samples analyzed for the Division of Technical Operations compared with fiscal years 1969 and 1970 was in accordance with plans as DTO put into operation their laboratory and had some samples analyzed by contract with two non-government laboratories. The results of analyses were provided in thirty-three memoranda listed on page 8 by title, date and name of the reporting individual.

TABLE 1

Summary of Analyses Performed by Support Services*
During Fiscal Year 1970

Type of Study	Number of Samples	Number of Determinations
Performed for Division of Technical Operations		
Incineration	249	604
Landfill	9	18
Total for DTO	258	622
Performed for Division of Demonstration Operations		
Incineration	1	14
Performed for Solid Waste Research (formerly Division of Research and Development)		
Resource Recovery	144	301
Ultimate Disposal	3	27
Processing	0	0
Total for SWR	147	328
Totals for DTO, DDO & SWR	406	964

*Formerly Research Services Laboratory, Division of Research and Development, Solid Waste Management Office.

TABLE 2

Summary of Analyses Performed by Support Services*
During Fiscal Year 1971

Type of Study	Number of Samples	Number of Determinations
Performed for Division of Technical Operations		
Incineration	126	374
National Data Network Survey	19	57
Total for DTO	145	431
Performed for Solid Waste Research (formerly Division of Research and Development)		
Resource Recovery	380	1455
Ultimate Disposal	10	68
Processing	6	20
Other	26	72
Total for SWR	422	1615
Totals for DTO & SWR	567	2046

*Formerly Research Services Laboratory, Division of Research and Development, Solid Waste Management Office.

LIST OF MEMORANDA WITH RESULTS OF ANALYSES (FY 1970)

1. Atlanta and New Orleans East Incinerator Impinger Water Residues. (9/9/69 Cohen)
2. Report on the Determination of the Percent Moisture in Samples from Virginia Beach Landfill. (12/3/69 Cohen)
3. Transmittal of Microbiological Data for Delaware County #3 Incinerator Study, January 26-30, 1970. (3/3/70 Peterson)
4. Composition of Samples Taken from Baled Refuse Prepared at Johnson City Compost Plant. (3/24/70 Cohen)
5. Analysis of Plastic Bags. (3/24/70 Ulmer)
6. Plastic Soft Drink Bottle Tests. (4/28/70 Bender)
7. The Carbon-Carbonate Content of Solid Samples Collected at the Hartsfield and Dekalb Incinerators in Atlanta, Georgia, and the New Orleans East Incinerator in New Orleans, Louisiana. (5/11/70 Wilson)
8. Results of Analysis for 5-Hydroxymethylfurfural and Glucose. (5/12/70 Coleman)
9. Quantitative Saccharification. (5/12/70 Carnes)
10. Delaware County Incinerator, Media, Pa. (5/14/70 Cohen)
11. Analysis of Fluid Bed Incinerator Residue. (6/1/70 Bender)
12. Weight of Coca Cola Bottles. (6/2/70 Coleman)
13. Analysis of Ten Miniature Plastic Bottles. (6/3/70 Ulmer)
14. Delaware County Incinerator, Media, Pa. (6/4/70 Cohen)
15. Soft Drink Bottle Tests. (6/16/70 Cohen)
16. The "Potential" Btu/# Content of Noncombustible-Residue Samples and Fly Ash Samples Collected at (1) Atlanta, (2) New Orleans, (3) Media and (4) Greenwood Incinerators. (6/30/70 Wilson)
17. Results of Analysis for 5-Hydroxymethylfurfural, Glucose and Quantitative Saccharification of Cellulose. (6/30/70 Barnett)
18. Incinerator Study - Greenwood, South Carolina. (7/1/70 Cohen)

LIST OF MEMORANDA WITH RESULTS OF ANALYSES (FY 1971)

1. Results of Analysis for 5-Hydroxymethylfurfural and Glucose. (7/13/70 Barnett)

2. Analysis of a Miniature Plastic Bottle. (7/17/70 Ulmer)

3. The Carbonate Carbon Content of Solid Samples Collected at the Delaware County Incinerator in Media, Pa., and the Pit Incinerator in Greenwood, South Carolina. (8/17/70 Wilson)

4. Results of Analysis for 5-Hydroxymethylfurfural, Glucose and Quantitative Saccharification of Cellulose. (8/27/70 Barnett)

5. The Carbon/Nitrogen Ratio of Samples Collected at the PHS-TVA Compost Plant Johnson City, Tennessee. (8/31/70 Wilson)

6. Analysis of Northern Kentucky Sanitation Company Landfill Runoff Water. (9/8/70 Cohen)

7. Results of Analysis for 5-Hydroxymethylfurfural and Glucose. (9/14/70 Barnett)

8. Results of Analysis for Glucose. (10/15/70 Barnett)

9. The Carbon/Nitrogen Ratio of Samples Collected at the PHS-TVA Compost Plant Johnson City, Tennessee-Part II. (11/4/70 Wilson)

10. Degradable Containers - Examination and Evaluation. (11/18/70 Cohen)

11. Decomposition of Carbonates in Solid Wastes Samples when Volatilizing at 600 C or at 950 C. (11/19/70 Wilson)

12. German Compost Analysis. (12/8/70 Cohen)

13. The Carbon-Hydrogen Contents and Loss-on-ignition (L.O.I.) at 950 C Values of Solid Samples Collected at the Delaware County Incinerator in Media, Pa. and Solid Samples Collected at the Pit Incinerator in Greenwood, S. C. (12/17/70 Wilson)

14. The Total Oxygen Content of Solid Samples Collected at: (1) Atlanta, (2) New Orleans, (3) Media, and (4) Greenwood Incinerators. (1/28/71 Wilson)

15. Results of Analysis for Quantitative Saccharification of Cellulose. (2/9/71 Barnett)

16. Verification of the Presence of Methionine in the Fungal Protein (BSWM) Produced at the Center Hill Facility. (2/10/71 Coleman)

17. Results of Organic Acid Analysis on Two Fermentation Samples. (2/10/71 Coleman)

18. The Btu/# Content of German Compost and Reference Compost. (2/25/71 Wilson)

19. The Carbon/Nitrogen Ratio of Samples Collected at the PHS-TVA Compost Plant, Johnson City, Tennessee -1971-I. (3/22/71 Wilson)

20. Results of Organic Acid Analysis on Five Fermentation Samples. (3/22/71 Coleman)

21. Microbiological Analyses of Refuse Samples. (3/24/71 Blannon)

22. Results of analyses for Amino Acid and Protein Composition of LSU Bagasse Protein. (3/29/71 Coleman)

23. Percent Nitrogen for Protein Analysis by Kjeldahl Analysis. (4/14/71 Bender)

24. German Compost Study - Addendum. (5/5/71 Bender)

25. Microbiological Analyses of Refuse Samples - Samples from Cleveland, Orlando, and Wichita Falls. (5/6/71 Blannon)

26. Percent Nitrogen for Protein Estimation by Kjeldahl Analysis (5/11/71 Bender)

27. Glucose Determination. (5/18/71 Bender)

28. Percent Nitrogen for Protein Estimation by Kjeldahl Analysis. (5/18/71 Bender)

29. Protein Content of Fungal Protein Grown on Various Wood Pulp Samples. (6/1/71 Coleman)

30. Boone County Surface Water. (6/2/71 Doerger)

31. Bacteriological Testing of Wall Board Samples Prepared from Waste Materials (6/15/71 Blannon)

32. Results of Analyses of Fly Ash Particulates. (6/22/71 Ulmer)

33. WQO Reference Samples Trace Metals. (6/24/71 Bender and Johnson)